AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1. (Currently Amended)   A method for registering images relating to a patient acquired using an imaging system, the imaging system having an overall detector coverage in an axial direction, the axial direction being defined by the direction of motion of a movable table for receiving the patient thereon, the method comprising:

determining a target area of interest;

obtaining scout image data responsive to said target area;

processing said target area by subdividing said target area in the axial direction into multiples of an increment of the overall detector coverage in the axial direction so as to create a plurality of sub-target areas of interest;

computing a desired image acquisition time having a duration greater than the duration of one breathing cycle of the patient;

operating said imaging system to create image data responsive to each of said sub-target areas;

processing said image data to determine a phase of said image data;

synchronizing said image data; and

combining said synchronized image data for each of said sub-target areas to create a set of image data of the target area of interest.

2. (Currently Amended)   The method of Claim 1 wherein each of said sub-target areas correspond[[s]] to a size of a detector in a selected axis.

3. (Original)   The method of Claim 1 wherein said target area of interest corresponds to a size of a target.

4. (Cancelled)

5. (Currently Amended)   The method of Claim 1 further comprising wherein said operating includes establishing an acquisition time for said image data corresponding to a physiological breathing cycle plus at least one of two thirds of a gantry rotation time and one gantry rotation time.

6. (Original)   The method of Claim 1, wherein said target area of interest is associated with an object to be imaged.

7. (Original)   The method of Claim 1 wherein said synchronizing includes utilizing said phase to correlate image data.

8. (Original)   The method of Claim 1 further comprising synchronizing PET emission data utilizing said phase.

9. (Currently Amended)   A system for registering images relating to a patient using retrospective gating, the system comprising:

an imaging system adapted to have the patient disposed upon a movable table for imaging by said imaging system, the imaging system having an overall detector coverage in an axial direction defined by the direction of motion of the table, wherein said imaging system generates image data responsive to the patient; and

a processing device, wherein said processing device is configured to execute the following steps:

determining a target area of interest;

obtaining scout image data responsive to said target area;

processing said target area by subdividing said target area in the axial direction into multiples of an increment of the overall detector coverage in the axial direction so as to create a plurality of sub-target areas of interest;

computing a desired image acquisition time having a duration greater than the duration of one breathing cycle of the patient;

operating the imaging system so as to create image data responsive to each of said sub-target areas;

processing said image data to determine a phase of said image data;

synchronizing said image data; and

combining said synchronized image data for each of said sub-target areas to create a set of image data of the target area of interest.

10. (Currently Amended)   The system of Claim 9 wherein each of said sub-target areas have a dimension along the axial direction that corresponds to a size of a the overall detector coverage in a selected axis the axial direction.

11-13. (Cancelled)

14. (Currently Amended)   The method system of Claim 9 wherein said synchronizing includes utilizing said phase of said image data to correlate image data of a same phase in a breathing cycle.

15. (Previously Presented)   A storage medium encoded with a machine-readable computer program code for registering images relating to a patient, the images acquired

using an imaging system with respiratory gating, the imaging system having an overall detector coverage in an axial direction, the axial direction being defined by the direction of motion of a movable table for receiving the patient thereon, said medium including instructions for causing a controller to implement a method comprising:

determining a target area of interest;

obtaining scout image data responsive to said target area;

processing said target area by subdividing said target area in the axial direction into multiples of an increment of the overall detector coverage in the axial direction so as to create a plurality of sub-target areas of interest;

computing a desired image acquisition time having a duration greater than the duration of one breathing cycle of the patient;

operating the imaging system to create image data responsive to each of said sub-target areas;

processing said image data to determine a phase of said image data;

synchronizing said image data; and

combining said synchronized image data for each of said sub-target areas to create a set of image data of the target area of interest.

16. (Currently Amended)   The storage medium of Claim 15 ~~further comprising computer program code~~ wherein said operating includes establishing an acquisition time for said image data corresponding to a ~~physiological~~ breathing cycle plus at least one of two thirds of a gantry rotation time and one gantry rotation time.

17. (Currently Amended)   The storage medium of Claim 15 ~~further comprising~~ wherein said computer program code ~~wherein said method~~ further includes instructions for causing the controller to implement the method step of:

synchronizing PET emission data utilizing said phase of said image data.

18-20. (Canceled)

21. (Currently Amended)   A system for registering images relating to a patient using retrospective gating, the system having an overall detector coverage in an axial direction, the axial direction being defined by the direction of motion of a movable table for receiving the patient thereon, the system comprising:

means for imaging a patient

means for determining a target area of interest relative to the patient;

means for obtaining scout image data responsive to said target area;

means for processing said target area by subdividing said target area in the axial direction into multiples of an increment of the overall detector coverage in the axial direction so as to create a plurality of sub-target areas of interest;

means for computing a desired image acquisition time having a duration greater than the duration of one breathing cycle of the patient;

means for operating said means for imaging ~~system~~ to create image data responsive to each said sub-target area;

means for processing said image data to determine a phase of said image data;

means for synchronizing said image data; and

means for combining said synchronized image data for each of said sub-target areas to create a set of image data of the target area of interest.

22. (Currently Amended)   The system of Claim 21 further comprising said means for operating including means for establishing an acquisition time for said image data corresponding to a ~~physiological~~ breathing cycle plus at least one of two thirds of a gantry rotation time and one gantry rotation time.

23. (Original) The system of Claim 21 further comprising:

means for synchronizing PET emission data utilizing said phase.

24. (Previously Presented)   A method for assigning phases in images acquired using an imaging system comprising an overall detector coverage in an axial direction defined by the direction of motion of a moveable table upon which an object to be imaged is disposed, the method comprising:

operating said imaging system to create image data of the object and generate system data, wherein said image data comprises a plurality of sub-target areas of interest that are multiples of an increment of the overall detector coverage in the axial direction, wherein said system data includes object physiological information and imaging system information corresponding to each respiratory cycle;

processing said image data and said system data to determine a phase of said image data; and

synchronizing said image data.

25. (Previously Presented)   The method of Claim 24 further including:

determining a reference point in said system data;

establishing said reference point as a zero phase pulse;

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assigning a phase of zero to an ith reference point of said system data and assigning a phase of 2 pi for a subsequent reference point; and

wherein said synchronizing includes selecting images with correlating phases.

26. (Original) The method of Claim 24 wherein said system data includes physiological data.

27. (Original) The method of Claim 26 wherein said physiological data includes respiratory cycle data.

28. (Original) The method of Claim 25 further including applying a wrap around technique to adjust said phase if said reference point occurs while said imaging system is not imaging.

29. (Previously Presented)   The method of Claim 1 wherein each increment of the multiples of an increment are equally dimensioned.

30. (Previously Presented)   The method of Claim 1 wherein the target area of interest has an axial dimension greater than the overall detector coverage in the axial direction.

31. (Previously Presented)   The method of Claim 1 wherein:

said operating comprises operating said imaging system at multiple acquisition locations that correspond to each sub-target area to create image data comprising more than one phase of one breathing cycle of the patient; and

said combining comprises combining said synchronized image data for each of said sub-target areas to create a set of image data of the target area of interest at one determined phase.

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32.   (New) The method of Claim 1, wherein:

each of said sub-target areas have a dimension along the axial direction equal to the overall detector coverage along the axial direction; and

said operating said imaging system comprises performing step-and-shoot acquisition at multiple consecutive locations corresponding with each of said sub-target areas, thereby facilitating the creation of the set of image data as if the set of image data were acquired employing a larger detector.

33.   (New) The system of Claim 9, wherein:

each of said sub-target areas have a dimension along the axial direction equal to the overall detector coverage along the axial direction; and

said operating the imaging system comprises performing step-and-shoot acquisition at multiple consecutive locations corresponding with each of said sub-target areas, thereby facilitating the creation of the set of image data as if the set of image data were acquired employing a larger detector.

34.   (New) The storage medium of Claim 15, wherein:

each of said sub-target areas have a dimension along the axial direction equal to the overall detector coverage along the axial direction; and

said operating the imaging system comprises performing step-and-shoot acquisition at multiple consecutive locations corresponding with each of said sub-target areas, thereby facilitating the creation of the set of image data as if the set of image data were acquired employing a larger detector.

35.   (New) The method of Claim 24, wherein:

each of said sub-target areas have a dimension along the axial direction equal to the overall detector coverage along the axial direction; and

said operating said imaging system comprises performing step-and-shoot acquisition at multiple consecutive locations corresponding with each of said sub-target areas, thereby facilitating the creation of a set of image data as if the set of image data were acquired employing a larger detector.